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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/591,246 | 05/08/2007 | Yoshinori Tokura | 295443US0X PCT | 8152 |

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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

| EXAMINER | |
|---|---|
| TRAN, TRANG Q | |
| ART UNIT | PAPER NUMBER |
| 2811 | |

| NOTIFICATION DATE | DELIVERY MODE |
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| 03/26/2008 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/591,246 | TOKURA ET AL. | |
| | Examiner | Art Unit | |
| | TRAN Q. TRAN | 2811 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *08 May 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 8-10* is/are rejected.

7)☒ Claim(s) *2-7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 May 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *08/31/2006, 11/17/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Double Patenting*

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re.Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

**Claim 1** is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/569089. Although the conflicting claims are not identical, they are not patentably distinct from each other. Present claim reads on the claim of copending Application No. 10/569089 such as the present invention claimed the former electrode comprising an $A_{1-x}B_x MO_{3-\delta}$ if $0 \leq x \leq 1$ and $0 = y$, and the other electrode comprising an A1-x'Bx'$MO_{3-\delta}$, if $0 \leq x' \leq 1$, $0 = y'$ which reads on the copending Application which claimed each electrode comprised $A_{1-x}B_x MO_{3-\delta}$.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### *Claim Rejections - 35 USC § 112*

Claim 8-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re. claim 8, the claimed recitation "at least one of the ferromagnetic...prepared by pulsed laser deposition" where the phrase "prepared by pulsed laser deposition" directs to the product and process claim. (The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. See, e.g., In re Garnero, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979)).

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

**Claims 1 and 6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura (JP 2001-320108) in view of Cauro (Persistent and transient photoconductivity in oxygen-deficient $La_{2/3}Sr_{1/3}MoO_{3-\delta}$ thin films).

**Re. claim 1**, Fig. 2 of Nishimura disclose a tunnel junction device, comprising an electrode (210), another electrode (240), and an electrically insulating layer (250) arranged between these electrodes, the former electrode (210) comprising an $A_{1-x}B_xM_{1-y}M'_yO_{3-\delta}$ ($LaSrMnO_3$) oxide ferromagnetic (including ferrimagnetic) electroconductive solid material, wherein x and y satisfy the conditions: $0 \leq x \leq 1$, and $0 \leq y \leq 1$, $\delta$ represents an oxygen deficiency ($LaSrMnO_3$ wherein x = 0, y = 0 and $\delta = 0$); "A" represents an element selected from the group consisting of Ca, Sr, Ba, and other alkaline earth elements, La and other rare earth elements, elements including Y, Bi, and Pb; B represents another element which is different from "A", selected from the group consisting of Ca, Sr, Ba, and other alkaline earth elements, La and other rare earth elements, elements including Y, Bi, and Pb; M represents a transition metal element such as Mn, Fe, Co, Ni, or Cu; and M' represents another transition metal element such as Mn, Fe, Co, Ni, or Cu, M' being different from "M", and the other electrode (240) comprising an $A_{1-x'}B_{x'}M_{1-y'}M'_{y'}O_{3-\delta}$ ($LaSrMnO_3$) oxide ferromagnetic (including ferrimagnetic) electroconductive solid material having a component ratio y' being not equal to y, wherein x' and y' satisfy the conditions: $0 \leq x' \leq 1$, and $0 \leq y' \leq 1$, $\delta$ represents an oxygen deficiency ($LaSrMnO_3$ wherein x = 0, y = 0 and $\delta = 0$).

Nishimura differs from the claimed invention in not explicitly teaching $\delta$ as an oxygen deficiency of each electrode ($LaSrMnO_3$).

Cauro teaches $La_{1-x}Sr_{1-x}MnO_{3-\delta}$ wherein $0.2 \leq x \leq 0.5$ and $\delta$ represents an oxygen deficiency (Introduction, also as seen in Table 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Nishimura by NPL that have $\delta$ as an oxygen deficiency, in order to keep charge neutrality.

**Re. claim 6**, the combined device discloses the tunnel junction device according to claim 1, wherein the electrically insulating layer comprises $SrTiO_3$ (Fig. 2 of Nishimura).

**Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura in view of Cauro as applied to claim 1 above, and further in view of Baum et a. (US Patent 6,117,571).

**Re. claim 5**, the combined device differs from the claimed invention in not explicitly teaching the tunnel junction device according to claim 1, where in the electrically insulating layer is an electrically insulating layer comprising $A_{1-x}B_xM_{1-y}M'_yO_{3-\delta}$ oxide wherein x and y satisfy the conditions: $0 \leq x \leq 1$ and $0 \leq y \leq 1$, $\delta$ represents an oxygen deficiency.

Saito teaches the material of the insulating layer is $LaMnO_3$, wherein $x = 0$ and $y = 0$.

It would have been obvious to one of ordinary skill in the art that the time the invention was made to modify the material of insulating layer of Nishimura by Saito,

have a tunnel barrier layer comprises $LaMnO_3$, at least for using alternative tunnel material layer for magnetic tunnel junction.

**Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura in view of Cauro as applied to claim 1 above, and further in view of Saito et a. (US Patent 6,556,473).

**Re. claim 7**, the combined device differs from the claimed invention in not explicitly teaching the tunnel junction device according to claim 1, where in the electrically insulating layer comprises $LaAlO_{3-\delta}$, $\delta$ represents an oxygen deficiency.

Saito teaches the material of the tunnel barrier layer (as the insulating layer) is $LaAlO_3$ (Col. 5, lines 50-52 and Col. 11, lines 7-10).

It would have been obvious to one of ordinary skill in the art that the time the invention was made to modify the material of insulating layer of Nishimura by Saito, have a tunnel barrier layer comprises $LaAlO_3$, at least for using alternative tunnel material layer for magnetic tunnel junction.

**Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura in view of Cauro as applied to claim 1 above, and further in view of Hsu et al. (US 2003/0001178).

**Re. claim 8**, the combined device differs from the claimed invention in not explicitly teaching the tunnel junction device according to claim 1, wherein at least one of the ferromagnetic (including ferrimagnetic) electroconductive solid materials

constituting the electrodes, and a solid material constituting the electrically insulating layer arranged between these electrodes is prepared by pulsed laser deposition.

Hsu teaches the perovskite material can be depsited using any suitable deposition technique including pulsed laser deposition (¶17).

It would have been obvious to one of ordinary skill in the art that the time the invention was made to modify the device of Nishimura that have the the insulating layer arranged between these electrodes is prepared by pulsed laser deposition, in order to achieve the design manufacturing.

### *Allowable Subject Matter*

Claims 2-4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TRAN Q. TRAN whose telephone number is (571)270-3259. The examiner can normally be reached on Mon - Thu (9am-5pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne A. Gurley can be reached on 571-272-1670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/T. Q. T./
Examiner, Art Unit 2811

/Cuong Q Nguyen/

Primary Examiner, Art Unit 2811